What is Claimed Is:

1. A positron emission tomography camera or scanner comprising:

a patient area,

a detector ring for detecting radiation from opposite sides of the patient area, the ring including a plurality of scintillation detectors directed towards the patient area, the scintillation detectors being such as to emit light when radiation is incident thereon, and

converting means optically coupled to the scintillation detectors for converting light emitted by the scintillation detectors to electrical pulses,

wherein the scintillation detectors comprise LuAP.

2. A camera or scanner as claimed in claim 1, wherein the scintillation detectors comprise another layer of scintillating crystal.

3. A camera or scanner as claimed in claim 2, wherein determining means are provided for determining whether detected radiation was incident on the LuAP or the other layer of scintillating material.

4. A camera or scanner as claimed in claim 3, wherein the determining means are operable to analyze the electrical signal to determine a pulse shape, the pulse shape being indicative of the layer in which the radiation was detected.

5. A camera or scanner as claimed in claim 2, wherein an optical element is provided between each scintillation detector and its associated converting means, the optical element being such that light from the LuAP is affected in one way and light from the other layer of scintillating crystal is affected in another way.

6. A camera or scanner as claimed in claim 5, wherein the optical element and the converting means are offset relative to the scintillator, so that each optical element and each converting means spans two adjacent scintillators.

7. A camera or scanner as claimed in claim 5, wherein the optical element is a wavelength divider, preferably comprising a glass filter and/or an interference filter and/or a diffraction grating and/or a prism and/or a diffractive micro-optic array and/or a refractive micro-optic array.

8. A camera or scanner as claimed in claim 1, wherein the converting means comprise photomultiplier tubes.

9. A camera or scanner as claimed claim 8, wherein the photomultiplier tubes are position sensitive.

10. A camera or scanner as claimed in claim 1, wherein the converting means comprise photodiodes and/or avalanche photodiodes.

11. A camera or scanner as claimed in claim 10, wherein the photodiodes and/or avalanche photodiodes are made of silicon.

12. A positron emission tomography camera or scanner comprising:

a patient area,

a detector ring for detecting radiation from opposite sides of the patient area, the ring including a plurality of scintillation detectors directed towards the patient area, the scintillation detectors being such as to emit light when radiation is incident thereon, and

converting means optically coupled to the scintillation detectors for converting light emitted by the scintillation detectors to electrical pulses,

wherein the scintillation detectors comprise LuYAP.

13. A camera or scanner as claimed in claim 12, wherein the scintillation detectors comprise another layer of scintillating crystal.

14. A camera or scanner as claimed in claim 13, wherein determining means are provided for determining whether detected radiation was incident on the LuYAP or the other layer of scintillating crystal.

15. A camera or scanner as claimed in claim 14, wherein the determining means are operable to analyze the electrical signal to determine a pulse shape, the pulse shape being indicative of the layer in which the radiation was detected.

16. A camera or scanner as claimed in claim 12, wherein an optical element is provided between each scintillation detector and its associated converting means, the optical element being such that light from the LuYAP is affected in one way and light from the other layer of the scintillation detector is affected in another way.

17. A camera or scanner as claimed in claim 16, wherein the optical element and the converting means are offset relative to the scintillator, so that each wavelength divider and each converting means spans two adjacent scintillators.

18. A camera or scanner as claimed in claim 16, wherein the optical element comprises a glass filter and/or an interference filter and/or a

diffraction grating and/or a prism and/or a diffractive micro-optic array and/or a refractive micro-optic array.

19. A camera or scanner as claimed in claim 12, wherein the converting means comprise photmultiplier tubes.

20. A camera or scanner as claimed claim 19, wherein the photomultiplier tubes are position sensitive.

21. A camera or scanner as claimed in claim 12, wherein the converting means comprise photodiodes and/or avalanche photodiodes.

22. A camera or scanner as claimed in claim 21, wherein the photodiodes and/or avalanche photodiodes are made of silicon.

23. A positron emission tomography camera or scanner comprising a plurality of scintillators, wherein the scintillators comprise $LuAlO_3$:Ce (LuAP).

24. A camera or scanner as claimed in claim 23, wherein the scintillators additionally comprise a layer of LSO positioned adjacent the LuAP.

25. A positron emission tomography camera or scanner comprising a plurality of scintillators, wherein the scintillators comprise $LuYAlO_3$:Ce (LuYAP).

26. A camera or scanner as claimed in claim 25, wherein the scintillators additionally comprise a layer of LSO positioned adjacent the LuYAP.

27. A scintillator for use in the camera or scanner as claimed in claim 1, wherein the scintillator comprises LuAP.

28. A scintillator for use in the camera or scanner as claimed in claim 12, wherein the scintillator comprises LuAP.

29. A scintillator for use in the camera or scanner as claimed in claim 12, wherein the scintillator comprises LuYAP.

30. A scintillator for use in the camera or scanner as claimed in claim 1, wherein the scintillator comprises LuYAP.

31. A positron emission tomography camera or scanner comprising:

a plurality of scintillation detectors directed towards a patient area, the scintillation detectors being such as to emit light when radiation is incident thereon, the scintillation detectors comprising two different layers of scintillation material, each of which emits different scintillation light, and

converting means optically coupled to the scintillation detectors for converting light emitted by the scintillation detectors to electrical pulses,

wherein an optical element is positioned in an optical path between the scintillation detectors and the converting means, the optical element being such that light from one layer of the scintillation detector is affected in one way and light from the other layer of the scintillation detector is affected in another way.

32. A camera or scanner as claimed in claim 31, wherein the optical element spans two adjacent scintillation detectors.

33. A camera or scanner as claimed in claim 32, wherein adjacent the optical element is secondary optical element that covers a part of the scintillation layer that is also covered by the optical element, wherein the secondary optical element affects light from each of the different scintillation layers in the same way.

34. A camera or scanner as claimed in claim 31, wherein the optical element comprises a glass filter and/or an interference filter and/or a diffraction grating and/or a prism and/or a diffractive micro-optic array and/or a refractive micro-optic array.

35. A camera or scanner as claimed in claim 2, wherein the other layer comprises LSO.

36. A camera or scanner as claimed in claim 13, wherein the other layer comprises LSO.